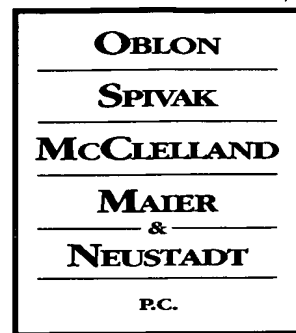




Docket No.: 195832US0DIV

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313



ATTORNEYS AT LAW

RE: Application Serial No.: 09/656,435  
Applicants: Akiko ITAI, et al.  
Filing Date: September 6, 2000  
For: METHODS FOR SEARCHING STABLE DOCKING  
MODELS OF BIOPOLYMER-LIGAND MOLECULE  
COMPLEX  
Group Art Unit: 1631  
Examiner: M. Borin

SIR:

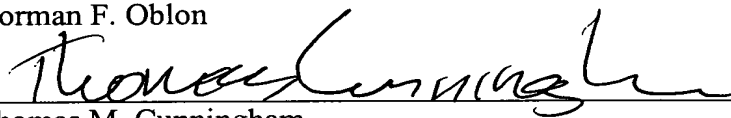
Attached hereto for filing are the following papers:

**Petition to Withdraw Holding of Abandonment; Copy of Date-stamped Filing Receipt, PTO Cover Letter, Request for Extension of Time and Amendment filed October 14, 2003**

Our check in the amount of \$0.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

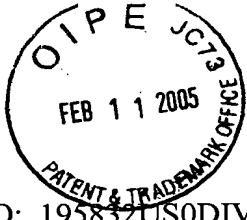
OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon

  
Thomas M. Cunningham  
Registration No. 45,394

Customer Number

**22850**

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DOCKET NO: 195852US0DIV

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
AKIKO ITAI, ET AL. : EXAMINER: M. BORIN  
SERIAL NO: 09/656,435 :  
FILED: SEPTEMBER 6, 2000 : GROUP ART UNIT: 1631  
FOR: METHODS FOR SEARCHING :  
STABLE DOCKING MODELS OF  
BIOPOLYMER-LIGAND MOLECULE  
COMPLEX

PETITION TO WITHDRAW HOLDING OF ABANDONMENT

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

The Applicants petition the Director under 37 C.F.R. §1.181 to withdraw the holding of abandonment of this application for failure to timely file a reply to the Official Action mailed April 14, 2003. While the Applicants have received a Notice of Abandonment, mailed February 8, 2005, as shown by the attached date-stamped filing receipt, a reply was filed October 14, 2003. PAIR does not indicate that this reply was ever entered into the eDAN/PAIR system. For the convenience of the examiner, a copy of this reply is attached to this petition. Accordingly, the Applicants respectfully request that the holding of abandonment be withdrawn.

Application No. 09/656,435

Petition to Withdraw Holding of Abandonment

The Applicants do not believe that any petition fee is due. However, in the event any variance exists between the required petition fees and this amount, please charge or credit the difference to our Deposit Account No. 15-0030.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon



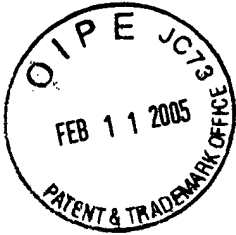
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(OSMMN 06/04)

**COPY**



OSMM&N File No. 195832US0DIV

Serial No. 09/656,435

In the matter of the Application of: Akiko ITAI, et al.

For: METHODS FOR SEARCHING STABLE DOCKING MODELS OF BIOPOLYMER-LIGAND MOLECULE COMPLEX

Dept.: Chemical

By: NFO/TMC/krs

Due Date: 10-14-03

The following has been received in the U.S. Patent Office on the date stamped hereon

- ☐ Check for \$475.00
- ☐ PTO Cover Letter
- ☐ Amendment
- ☐ Request for Extension of Time three month
- ☐ Small Entity Status is claimed



**BEST AVAILABLE COPY**

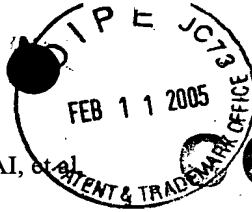
Docket No. 195832US0DIV

IN RE APPLICATION OF: Akiko ITAI, et al

SERIAL NO: 09/656,435

FILED: September 6, 2000

FOR: METHODS FOR SEARCHING STABLE DOCKING MODELS OF BIOPOLYMER-LIGAND MOLECULE COMPLEX



**COPY**

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

Transmitted herewith is an amendment in the above-identified application.

- ☐ No additional fee is required
- ☐ Small entity status of this application under 37 C.F.R. §1.9 and §1.27 is claimed.
- ☒ Additional documents filed herewith: Request for Extension of Time (three month)

The Fee has been calculated as shown below:

CLAIMS	CLAIMS REMAINING		HIGHEST NUMBER PREVIOUSLY PAID	NO. EXTRA CLAIMS	RATE	CALCULATIONS
TOTAL	3	MINUS	20	0	x \$18 =	\$0.00
INDEPENDENT	2	MINUS	6	0	x \$86 =	\$0.00
		<input type="checkbox"/> MULTIPLE DEPENDENT CLAIMS			+ \$290 =	\$0.00
		TOTAL OF ABOVE CALCULATIONS				\$0.00
		<input checked="" type="checkbox"/> Reduction by 50% for filing by Small Entity				\$0.00
		<input type="checkbox"/> Recordation of Assignment			+ \$40 =	\$0.00
		TOTAL				\$0.00

- ☒ A check in the amount of **\$475.00** is attached.
- ☐ Credit card payment form is attached to cover the fees in the amount of **\$0.00**
- ☒ Please charge any additional Fees for the papers being filed herewith and for which no check or credit card payment is enclosed herewith, or credit any overpayment to deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.
- ☒ If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time may be charged to Deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

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**COPY**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF: Akiko ITAI, et al.

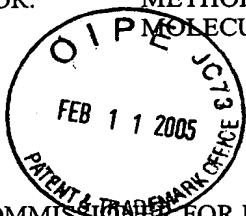
SERIAL NO: 09/656,435

GAU: 1631

FILED: September 6, 2000

EXAMINER: Michael Borin

FOR: METHODS FOR SEARCHING STABLE DOCKING MODELS OF BIOPOLYMER-LIGAND  
MOLECULE COMPLEX



**REQUEST FOR EXTENSION OF TIME  
UNDER 37 C.F.R. 1.136**

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

It is hereby requested that a **three** month extension of time be granted to October 14, 2003 for

- ☒ filing a response to the Official Action dated: April 14, 2003
- ☐ responding to the requirements in the Notice of Allowability dated:
- ☐ filing the Formal Drawings. The Issue Fee due has been timely filed.
- ☐ responding to the Notice to File Missing Parts of Application dated:
- ☐ filing a Notice of Appeal. A timely response to the final rejection, due has been filed.
- ☐ filing an Appeal Brief. A Notice of Appeal was filed on:
- ☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown below is reduced by one-half.

The required fee of \$475.00 is enclosed herewith by check and any further charges may be made against the Attorney of Record's Deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully Submitted,

OBLON, SPIVAK, McCLELLAND,  
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Thomas M. Cunningham

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DOCKET NO.: 195832US0DIV

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF

AKIKO ITAI, ET AL.

SERIAL NO: 09/656,435

FILED: SEPTEMBER 6, 2000

FOR: METHODS FOR SEARCHING  
STABLE DOCKING MODELS OF  
BIOPOLYMER-LIGAND  
MOLECULE COMPLEX



: EXAMINER: BORIN, MICHAEL L.

: GROUP ART UNIT: 1631

AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

SIR:

In response to the Office Action dated April 14, 2003, the Applicants respectfully request reconsideration of the rejections of record in view of the following amendments and remarks.

**Amendments to the Claims** begin on page 2.

**Remarks** begin on page 4.

AMENDMENTS TO THE CLAIMS

Claims 1-13 (Cancelled):

14 (New): A method for predicting at least one stable docking configuration of hydrogen-bonding heteroatoms in a ligand for corresponding hydrogen-bonding groups in a ligand binding region of a biopolymer comprising:

A. inputting the three-dimensional coordinates for a ligand binding region of a biopolymer and the coordinates of a ligand, wherein the coordinates represent an arbitrary conformation of the ligand,

B. setting dummy atoms at the positions of heteroatoms that can be hydrogen-bond partners with the hydrogen bonding groups in the ligand binding region of the biopolymer,

C. comparing the distances between the positions of the dummy atoms and the distances between the hydrogen bonding heteroatoms in the ligand while changing the configuration of the ligand, and

D. selecting a configuration of the hydrogen-bonding heteroatoms in the ligand that corresponds with the configuration of the dummy atoms,

thereby predicting a stable docking configuration of the heteroatoms in the ligand for the ligand-binding region of the biopolymer.

15 (New): A method for predicting at least one conformation of a ligand that binds to a ligand binding region of a biopolymer comprising:

A. inputting the three-dimensional coordinates for a ligand binding region of a biopolymer and the coordinates of a ligand, wherein the coordinates represent an arbitrary conformation of the ligand,

B. setting dummy atoms at the positions of heteroatoms that can be hydrogen-bond partners with the hydrogen bonding groups in the ligand binding region of the biopolymer,



C. comparing the distances between the positions of the dummy atoms and the distances between the hydrogen-bonding heteroatoms in the ligand while changing the conformation of the ligand, and

D. selecting a conformation of the ligand in which the configuration of hydrogen-bonding heteroatoms in the ligand corresponds with the configuration of the dummy atoms, thereby predicting a conformation of the ligand that binds to the ligand binding region of the biopolymer.

16 (New): The method of Claim 15, further comprising:

E. dividing the ligand into a hydrogen-bonding part and a non-hydrogen-bonding part, and

F. applying the steps of Claim 15 while regarding the hydrogen-bonding part as a ligand.

REMARKS

Claims 14-16 are pending. Claims 14 and 15 track prior Claims 12 and 13. Claims 14-16 find support in the original claims and in the specification, see the specification, page 5, last paragraph through page 9 and Fig. 2. Specifically, obtaining the atomic or three-dimensional coordinates of the biopolymer is described on page 10, last two lines-page 11 of the specification, and obtaining the atomic coordinates of the ligand molecule is described on page 18, lines 2-11, of the specification. Preparation of combination sets of dummy atoms and hydrogen-bonding heteroatoms is described on page 19, lines 7-page 20, line 2. Comparison of distances between the hydrogen-bonding heteroatoms in the ligand molecule and the dummy atoms is described, for instance, on page 19, last three lines-page 21, line 2. Exclusion or selection criteria are described on pages 21-23, see e.g., the formula on page 21, lines 11-14, and page 22, lines 10-15. Division of a ligand molecule into a hydrogen-bonding part and a non-hydrogen bonding part, as recited by step E of Claim 16, is described in the specification at page 20, lines 14-15 and in Fig. 1b. Accordingly, the Applicants do not believe that any new matter has been added.

The Applicants thank Examiner Borin for the courteous and helpful interview of June 18, 2003. Claim language that would help avoid the rejections of record was discussed. The amendment above is based on this claim language. Favorable consideration is respectfully requested.

Rejection—35 U.S.C. 112, second paragraph

Claims 12-13 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. This rejection is moot in view of the cancellation of Claims 12 and 13.

The Applicants submit that parts A, B, D, E, G and H of the prior rejection would not apply to new Claims 14-16. With respect to parts C and F of the prior rejection, the Applicants submit that the terms "stable" and "selecting" as used in Claims 14-16 are clear when read in light of the specification by one with skill in the art. For instance, page 22, line 15, of the specification indicates that conformations having an intramolecular energy of greater than 100 kcal/mol may be excluded and page 25, line 13 indicates that the upper limit for the energy sum of the intramolecular interaction and intramolecular energy is preferably about 1,500 kcal/mol. Moreover, one with skill in the art could select a more stable structure based on the ranking of different docking models in the increasing order of energy; see the specification, page 26, lines 11-12. For example, a selection may be made on the basis of the lowest energy docking model, see page 26 of the specification generally.

Rejection—35 U.S.C. 112, first paragraph

Claims 12-13 were rejected under 35 U.S.C. 112, first paragraph, as lacking adequate description. These rejections are moot in view of the cancellation of these claims. The Applicants submit that this rejection would not apply to new Claims 14-16 in view of the descriptive support for these claims indicated above.

Rejection—Double Patenting

Claim 13 was rejected under the judicially-created doctrine of obviousness-type double patenting over U.S. Patent No. 5,642,292. This rejection is moot in view of the cancellation of Claim 13. The Applicants respectfully request that any response to such a rejection for new Claims 14-16 be deferred until the identification of otherwise allowable subject matter.

CONCLUSION

In view of the above amendments and remarks, the Applicants respectfully submit that this application is now in condition for allowance. Early notification to that effect is earnestly solicited.

Respectfully submitted,

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